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# **MCSE Guide to Designing a Microsoft Windows 2000 Network Infrastructure**

**Jane Holcombe, Chuck Holcombe**

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## **MCSE Guide to Designing a Microsoft Windows 2000 Network Infrastructure**

by Jane Holcombe and Chuck Holcombe

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# Preface

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**W**elcome to the *MCSE Guide to Designing a Windows 2000 Network Infrastructure*! This book provides in depth coverage of the knowledge and skills required to pass Microsoft certification exam 70-221: *Designing a Microsoft Windows 2000 Network Infrastructure*. This course of study prepares a network professional to work in medium to very large computing environments that use the Windows 2000 network operating system. Organizations place greater and greater demand on their networks, often providing round-the-clock services to both internal and external clients. Therefore, there is increased demand for network professionals who can design the underlying services and protocols to reliably support the necessary network usage.

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## THE INTENDED AUDIENCE

The goal of this book is to teach network services design to individuals who desire to learn about that topic for practical purposes, as well as those who wish to pass Microsoft exam, #70-221. This book provides the content for all the skills measured on that exam, but also provides related information that is not directly tested.

**Chapter 1**, “Windows 2000 Network Infrastructure Overview” provides an overview and history of the standards and technologies on which our present network infrastructures are built. It explains the basic network connectivity models and the Windows 2000 TCP/IP protocols and services. **Chapter 2** “Analyzing Business Requirements” emphasizes the importance of understanding the business for which a network is being designed. It shows how to identify existing and planned business models, existing company processes, organizational structures, company strategies and IT management structure. **Chapter 3**, “Analyzing Technical Requirements” focuses on understanding the organization’s existing and planned technical environment and goals. It examines the impact of infrastructure design, client computer network access requirements and disaster recovery strategies.

**Chapter 4**, “TCP/IP Network, IP Configuration, and Name Resolution Strategies” begins building the technical foundation of a network infrastructure. This chapter teaches how to design a TCP/IP networking strategy and IP configuration strategies using static addressing and DHCP. It then delves into name resolution strategies using both DNS and WINS. **Chapter 5**, “Designing a Multi-Protocol Strategy”, focuses on creating a Windows 2000 environment which can integrate NetWare, access IBM mini and mainframe systems, connect to UNIX hosts, and allow access for Macintosh systems.

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**Chapter 6** “Designing a Dfs Strategy” describes the features, terminology, process and network activities of Dfs. It helps the reader to understand the roles of functionality, security, availability, and performance in a Dfs design. **Chapter 7** “Designing a WAN Infrastructure” focuses on the design of Wide Area Networks. It covers using RRAS to connect locations and for designing and implementing dial-up remote access. It also covers designing a demand-dial routing strategy and a VPN strategy.

**Chapter 8** “Designing an Internet Connectivity Strategy” looks at the issues involved in accessing the Internet from a private network. It discusses the value of firewalls, the features of Microsoft Proxy Server 2.0 and how to use Proxy Server 2.0 to create a functional Internet connectivity design, and to create secure Internet connectivity designs. It also describes the major improvements contained in Microsoft ISA Server. **Chapter 9** “Designing for Internet and Intranet Services” looks at the opposite issue—providing an infrastructure for services to the Internet. It discusses the steps involved in designing an infrastructure for both an Internet site and an intranet site, and identifies common design considerations for providing services.

**Chapter 10** “Designing a Management and Implementation Strategy for Windows 2000 Networking” covers how to design a strategy for monitoring and managing Windows 2000 network services. The chapter describes monitoring and managing tools, how to develop appropriate response strategies for network problems, and how to design a resource strategy.

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## FEATURES

To ensure a successful learning experience, this book includes the following pedagogical features:

- **Chapter Objectives:** Each chapter in this book begins with a detailed list of the concepts to be mastered within that chapter. This list provides you with a quick reference to the contents of that chapter, as well as a useful study aid.
  - **Illustrations and Tables:** Numerous illustrations of server screens and components aid you in the visualization of common setup steps, theories, and concepts. In addition, many tables provide details and comparisons of both practical and theoretical information and can be used for a quick review of topics.
  - **End of Chapter Material:** The end of each chapter includes the following features to reinforce the material covered in the chapter:
    - **Summary:** A bulleted list is provided which gives a brief but complete summary of the chapter
    - **Review Questions:** A list of review questions tests your knowledge of the most important concepts covered in the chapter
    - **Key Terms List:** A list of all new terms and their definitions
-

- **Hands-on Projects:** Hands-on projects help you to apply the knowledge gained in the chapter
- **Case Study Projects:** Case study projects take you through real world scenarios
- **On the CD-ROM:** On the CD-ROM you will find **CoursePrep®** exam preparation software, which provides 50 sample MCSE exam questions mirroring the look and feel of the MCSE exams, and **CourseSim®** simulation software, which allows you to perform tasks in a simulated Windows 2000 network environment.

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## TEXT AND GRAPHIC CONVENTIONS

Wherever appropriate, additional information and exercises have been added to this book to help you better understand what is being discussed in the chapter. Icons throughout the text alert you to additional materials. The icons used in this textbook are as follows:



Tips are included from the author's experience and provide extra information on resources related to network design.



The Note icon is used to present additional helpful material related to the subject being described.



Each Hands-on Project in this book is preceded by the Hands-on icon and a description of the exercise that follows.



Case project icons mark the case project. These are more involved, scenario-based assignments. In this extensive case example, you are asked to implement independently what you have learned.

---

## INSTRUCTOR'S MATERIALS

The following supplemental materials are available when this book is used in a classroom setting. All of the supplements available with this book are provided to the instructor on a single CD-ROM.

**Electronic Instructor's Manual.** The Instructor's Manual that accompanies this textbook includes:

- Additional instructional material to assist in class preparation, including suggestions for classroom activities, discussion topics, and additional projects.
  - Solutions to all end-of-chapter materials, including the Review Questions, Hands-on Projects and Case Projects.
-

**ExamView®** This textbook is accompanied by ExamView, a powerful testing software package that allows instructors to create and administer printed, computer (LAN-based), and Internet exams. ExamView includes hundreds of questions that correspond to the topics covered in this text, enabling students to generate detailed study guides that include page references for further review. The computer-based and Internet testing components allow students to take exams at their computers, and also save the instructor time by grading each exam automatically.

**PowerPoint presentations.** This book comes with Microsoft PowerPoint slides for each chapter. These are included as a teaching aid for classroom presentation, to make available to students on the network for chapter review, or to be printed for classroom distribution. Instructors, please feel at liberty to add your own slides for additional topics you introduce to the class.

---

## ACKNOWLEDGMENTS

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Although both Chuck and I had done a great deal of writing in our careers—I had written dozens of technical courses and Chuck had authored many management courses and analyses for his management clients—neither of us had undertaken a project quite like this. We were naïve first authors, not truly understanding the sacrifices we would have to make to produce the book we envisioned. We quickly learned that we had the exquisite luck of having a remarkable Course Technology team behind us for the entire project.

Our Product Manager, Laura Hildebrand, unstintingly provided guidance, great problem-solving skills, and (sometimes) therapy. She ran interference for us in so many ways and managed us with wisdom and compassion. Thank you, Laura!

We were incredibly lucky to have Jill Batistick, a world-class Development Editor, to teach us, hold our hands, goad, demand, criticize, support, and help us to be concise, accurate, and focused. She did whatever was necessary to keep us on schedule, including badgering, nagging, ordering, and dangling the prospect of the possible rewards of a truly successful book. Her clever editing and patience when we just could not catch on to what would make a chapter flow well for the student got us through some rough places. We are sure she has

---



dedicated a few gray hairs to us, and put in many long workdays to bring this project to fruition. We cannot imagine having a more professional, hardworking, smarter or more fun development editor. Thank you, Jill!

Tom Lancaster was the technical editor on all but chapter 9. He took his editorial duties *very* seriously and held our feet to the fire when we omitted a significant fact or turned a phrase in such a way as to distort a technical meaning. He also worked to broaden the outlook of this book beyond a strict Microsoft view of networking, to better show where the networking technology provided by Microsoft fits into the networking world in general. We spent as much time refining a chapter in response to his comments, as we would spend on the entire first draft of the chapter.

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We periodically sent out cries for help to a group of knowledgeable and talented friends. Usually one or more of them would come through with an answer to help us out of a tight spot. This group included George Spalding, Bill English, Daniel Webster, Greg Lyon, Fred Shimmin, David Stavert, Sharon Morgan, Dale Morgan, Tina Rankin, and Kim Lund.

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To everyone who helped we offer sincere thanks.

---

## DEDICATION

This book is dedicated to the memory of two people we love and miss: Tenus Marie Holcombe and Mark Kevin Shimmin.

---

## READ THIS BEFORE YOU BEGIN

### To the User

This book was written with the network professional in mind. It provides an excellent preparation for the Microsoft exam 221, and also for the real-life tasks involved in designing network services for today's networks, which must support an ever-increasing variety of applications. To fully benefit from the content and the projects presented here, you will need access to a classroom lab containing computers configured as follows:

- Windows 2000 Server or Windows 2000 Advanced Server. In a classroom lab situation each student or pair of students should have one server that is a member of a Windows 2000 Active Directory domain.
- An Internet connection is helpful, and will be required for some of the case projects.

### Visit our World Wide Web Site

Additional materials designed especially for you might be available for your course on the World Wide Web. Go to *www.course.com*. Search for this book title periodically on the Course Technology Web site for more details.

### To the Instructor

When setting up a classroom lab, make sure each student workstation has Windows 2000 Server, and is a member server in a Windows 2000 domain. Students will need access to the Windows 2000 source files when they install the various services during the hands-on projects. Each student will need administrative rights to their own server. Detailed setup instructions for the labs are contained in the Instructor's Manual.

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